A New Class of Hydrogen Ion Battery: Coulomb-Suspended Cubic Proton Grids Nested Within Permanently Ionized Pb+ Cubic Crystal Lattices

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Introduction

Existing hydrogen ion battery technology is based upon the idea of using semiconductor materials with nanoscopic structures that create crevices in which hydrogen ions A.K.A. protons can be trapped. Each proton can generally carry or store one electron each. Hydrogen being abundant and the overall design being durable means that hydrogen ion technology is somewhat proven and has genuine promise as a potential replacement for lithium ion technology. Lithium, fundamentally, given its three protons per atom, has an ostensibly greater carrying capacity for electricity thanks to its greater complement of protons.

Materials made from even heavier elements have a theoretically greater electrical storage capacity, but most of them are unsuitable due to limitations to the rate at which electricity may enter or exit the storage medium. An ideal battery should be maximally capacitative, quick to charge, quick to discharge when large bursts of power are called for and should be durable; capable of functioning through as many charge cycles as possible. At this time, I wish to share a technology that, although it is based upon hydrogen ions, has a potential that far exceeds that of lithium ion energy storage in terms of durability, charge rate, discharge rate, and storage capacity.

Abstract

I term this technology the Coulomb-Suspended Cubic Proton Grid or CSPG, for short. A simple chamber filled with hydrogen gas is nested within a larger cube consisting of a crystal that is heavily ionic but non-conductive, composed of an ionized metal embedded within a non-conductive material such as a simple polymer. The synthetic crystal would feature a series of highly ionized atoms in perfect alignment. In our example, we'll say that the material is ionized lead; lead being a good candidate given its low cost and high proton count.

When hydrogen gas is introduced into the H+ storage chamber, the protons, which would normally move about haphazardly, are rigidly aligned by the powerful Coulomb force of the aligned ions of the larger cubic structure. The walls of the inner cube would simply be made from the same non-conductive material.

Conduction pins are built into the cube, providing thin pathways through which the device may be charged or discharged.

Radically different from previous designs, the CSPG can rigidly hold protons in positions of close proximity (about half the distance typically allowed by the electron orbiting hydrogen,) a feature that radically alters their collective

storage capacity. Under the aforementioned condition, the protons behave as a single, ultraheavy element in terms of their capacity for holding electrons in their field of influence. A grid consisting of only 1000 such hydrogen ions would be able to store far more than 1000 electrons. The areas closest to the center of the grid should contain the majority of stored electrons as the attractive forces are greatest near the center, however, many electrons would orbit the body of protons as a whole with the entirety of this body of protons acting in many ways as a Bose-Einstein Condensate in which not only is there a quantum connection between all of the atoms, but in which electrons choose to orbit the overall molecule rather than individual atoms.
In order for the hydrogen atoms to assume the desired position during initial manufacture, hydrogen must be absolutely anionized when the chamber is charged with protons. In this way, the protons may come into close physical proximity to one another and remain in this way even after electrons are subsequently added.

Critical for the successful function of this proposed design would be fine control over the depth of the conduction pins (these would function like adjustable "points" used in drinking water wells.) Also critical would be pre-filling the gas chamber with the ideal number of protons (too many or too few would result in a defective unit) and preventing any gas leaks.

That said, given that in this design, the hydrogen is acting both as anode and electrolyte, the device would have remarkable longevity. Conduction pins on the charging side would project electrons from a relatively shallow depth toward the proton grid and would be in a fixed position. Retrieving electricity from the storage device would involve only establishing a circuit and occasionally modifying the point depth under the circumstance that power is running low, although this may not be necessary.

Despite containing a heavy metal, the bulk of the volume of such a battery would be composed of polymer and would be far lighter in weight than lithium batteries. For the device to function, however, the shape of the battery must always be a perfect cube.

Depending upon the required battery size, the traditional position of an electric car's battery below the floor may have to be reconsidered. As a backup system for powering an entire home, the shape of the units should not pose any problem. A unit the size of a washing machine would be capable of powering a home for several days. A unit a little smaller (would fit under the hood) could help to propel a vehicle several hundred miles.

Conclusion

The development of such a technology would be revolutionary as CSPG voltage cells would have unrivaled capacity and would have the unique ability to self-recharge through SASE effects.